Allied Telesis™
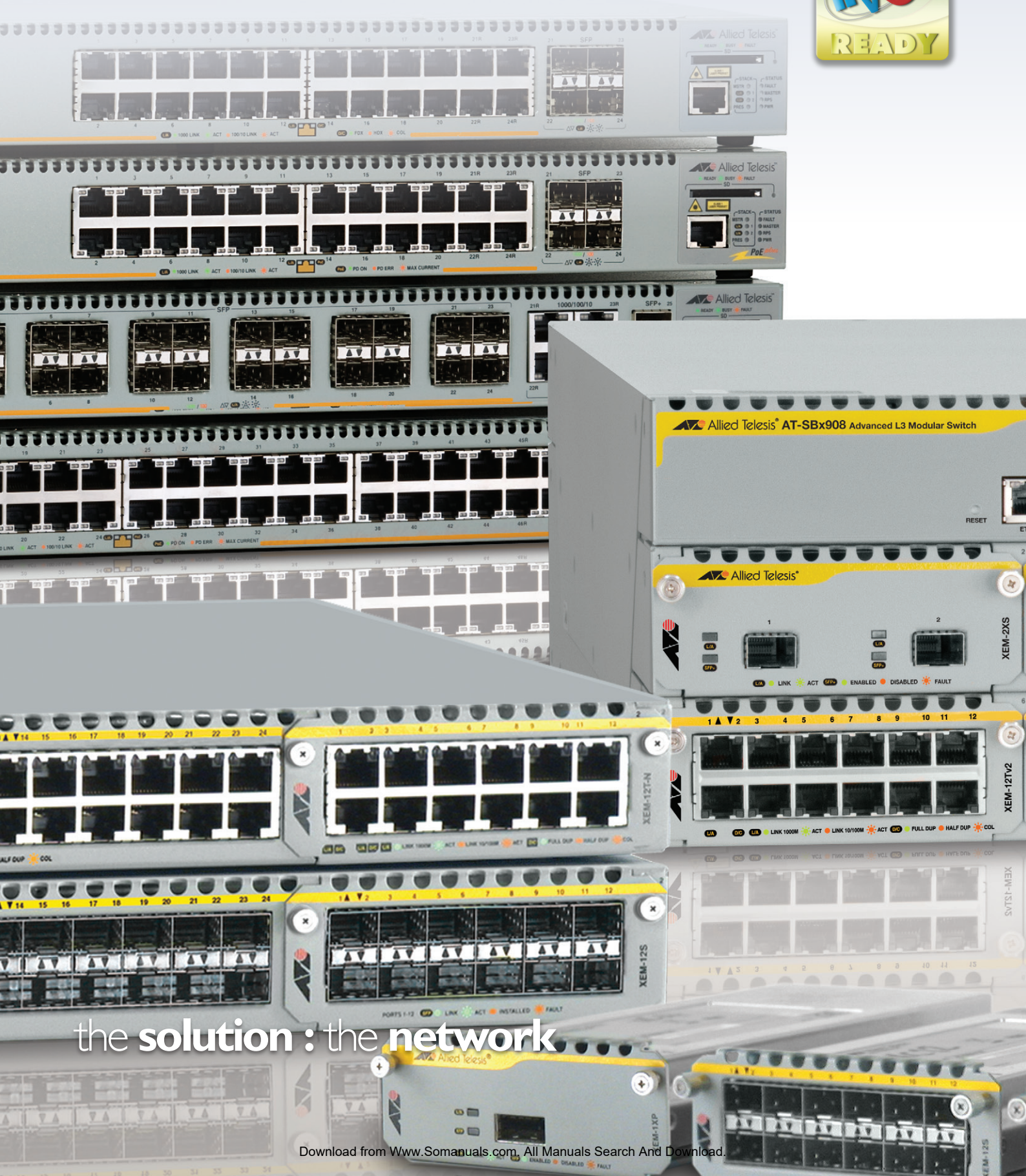
High Availability IPv6

AT-SBx908 Advanced L3 Modular Switch

the **solution** : the **network**

Introduction

The Internet has forever changed contemporary society, with online access an integral part of our 21st century lifestyles. Finding out what movie is on, or the location of a restaurant when out with your smart-phone, shopping online and booking your next holiday are just a few of the things we now take for granted. Businesses rely on online resources more than ever, with everything from standard access to email and servers, to business critical applications such as medical systems, transport signalling, and security requiring a high availability network.

The Internet and networks in general rely on Internet Protocol (IPv4) addresses for connectivity and to manage communication between separate systems as well as individual devices. The extraordinary growth of connected systems and devices has necessitated a move towards using the next generation IP communication protocol, known as IPv6.

Allied Telesis networks provide small, medium and large organizations with a cost-effective solution for resilient, wirespeed IPv4 and IPv6 communication.

Allied Telesis offers high-availability solutions across a range of Layer 3 switch products, with a wide choice of Ethernet port combinations and price/performance options. We are able to offer solutions to everyone from small schools to urban rail systems to businesses with thousands of employees.

In our key medical and transport sectors, network-based applications may be sensitive to even a few seconds of communication failure. We understand that a high availability infrastructure is no longer a luxury; maintaining resource availability and data security is now of paramount importance.

This solution explores the key Allied Telesis technologies that ensure a smooth transition to IPv6 networking to provide a high availability infrastructure, including the dynamic routing of data.

Benefits

The principal benefits of the high availability IPv6 solution are:

» Resiliency

» Ease of management

» Ease of transition from IPv4

» Scalability

Next generation network transition

Allied Telesis solutions offer the same levels of performance, high availability and manageability for both IPv4 and IPv6 networks. As you move from a current IPv4 network to a next generation IPv6 network, some transition will be required to ensure the new network will communicate with other local and remote devices and systems. Allied Telesis provide two mechanisms to facilitate this transition; dual stack and tunnelling.

With dual stacking, IPv4 and IPv6 can co-exist seamlessly on the same equipment, using equivalent routing protocols, within the same topology. An organization can be confident that the network will support their transition from IPv4 to IPv6 at a pace that suits them. Their IPv6 network can be overlaid on the same equipment, in the same physical and logical layout, as their original IPv4 network.

The equipment can be managed equally by IPv4 or IPv6, enabling a smooth transition of the network management infrastructure as well.

Tunnelling allows IPv6 traffic to be encapsulated within IPv4 packets. This means an organization wishing to move to IPv6 can do so even if their Internet and other remote connectivity still require IPv4.

As modern networks have grown in both size and functionality, dynamic routing protocols have been employed to manage traffic paths and load across the various devices and components of the network. Newer versions of these dynamic routing protocols have been created to support the increasing prevalence of IPv6. For example OSPFv3 is an update on OSPFv2 to support IPv6 networks.

Allied Telesis IP transition technologies, and support for the latest versions of commonly used dynamic routing protocols, ensure an easy transition to next generation networking, without having to change infrastructure or update key networking components.

In particular, the area layout and subnet allocation used for IPv4 with OSPFv2 can be overlaid with an equivalent structure for IPv6 with OSPFv3. Thereby, the logical network structure that has been established for an existing IPv4 network can seamlessly carry over to the coexisting IPv6 network as shown in diagram 1 on page 4.

Allied Telesis creates off-the-shelf switches and routers with feature-rich, high-performance IPv4 and IPv6 implementations in the same box.
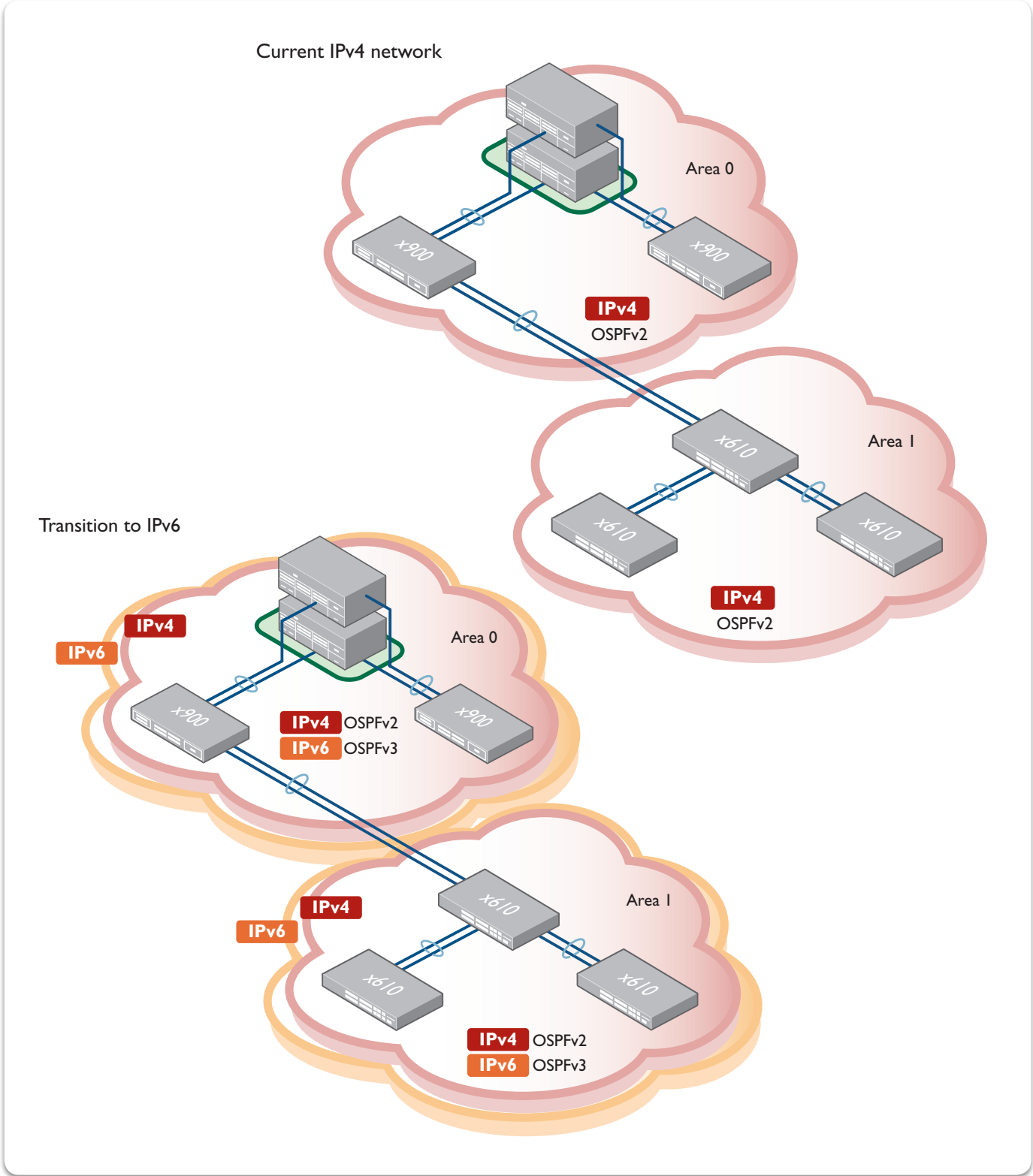
Diagram 1

High availability IPv6 networking

Allied Telesis high availability solutions work equally well for IPv4 and IPv6 networks, and even networks that are in transition using a combination of both protocols. To provide a highly resilient solution requires that the infrastructure and features of the networking equipment, as well as the traffic passing through the devices, is well managed and can survive any disturbance or interruption to normal network connectivity.

With most networks making use of routing protocols, it is imperative that the dynamic nature of this traffic management is handled in any fault situation to ensure continuous online resource access is not compromized. Adding dynamic routing resilience to high availability network design guarantees superior performance.

Two key technologies from which we have built the high-availability IPv6 solution are Virtual Chassis Stacking (VCStack™) and graceful restart (also known as non-stop forwarding).

VCStack provides a network infrastructure with no single point of failure that automatically responds to any connectivity loss. Graceful restart manages changes in the network topology to keep active paths through the network available, and minimize downtime that might otherwise be experienced when a network switch is taken offline.

We can take a closer look at these two technologies.

> Allied Telesis provides a completely resilient solution for next generation networks – minimize downtime and maximize access to online resources and applications.

Virtual Chassis Stacking (VCStack)

Using VCStack at the core of your network allows multiple switches to appear as a single virtual chassis. This virtual chassis acts as a single switch, simplifying management.

With VCStack, Allied Telesis now provides a truly resilient network. In normal operation, all bandwidth and all routing power in the network are fully available for use all the time. If a link or device fails, some of the bandwidth or forwarding power will be lost, but the network will still be fully operational and all remaining resources will continue to be fully utilized.

Diagram 2 shows link aggregation between the core VCStack and edge switches. With link aggregation across ports on different virtual chassis members, there is no perceptible disruption in the case of a link failure, and the full bandwidth of the network is available. Link aggregation is also used to connect network resources, such as servers, across the virtual chassis members. This ensures device and path resiliency.

Fast failover between stack members provides for an almost uninterrupted network service. In a VCStack environment, one of the stack members acts as the master switch, and provides decision making for the virtual chassis. All of the other VCStack members are in active standby, also having learnt routing and forwarding information for the network to ensure that if the master were to fail, another member is able to seamlessly assume control of the virtual chassis with minimal network downtime. Failover and recovery can be completed in as little as three seconds.

Allied Telesis also includes long distance stacking in the VCStack solution. Long distance stacking enables the VCStack solution to provide a distributed network core. The increased distance provided by fiber stacking connectivity means that members of the virtual chassis do not have to be co-located, but can be kilometres apart.

All of the benefits and powerful features of VCStack remain exactly the same – Allied Telesis long distance stacking provides a genuine distributed virtual network core.

The powerful VCStack solution offers uninterrupted network access and high availability of critical resources, and yet is very simple to manage with almost plug-and-play configuration. Whether your virtual chassis is located in the same equipment rack, or distributed across the campus, VCStack provides resiliency, scalability and ease of management.
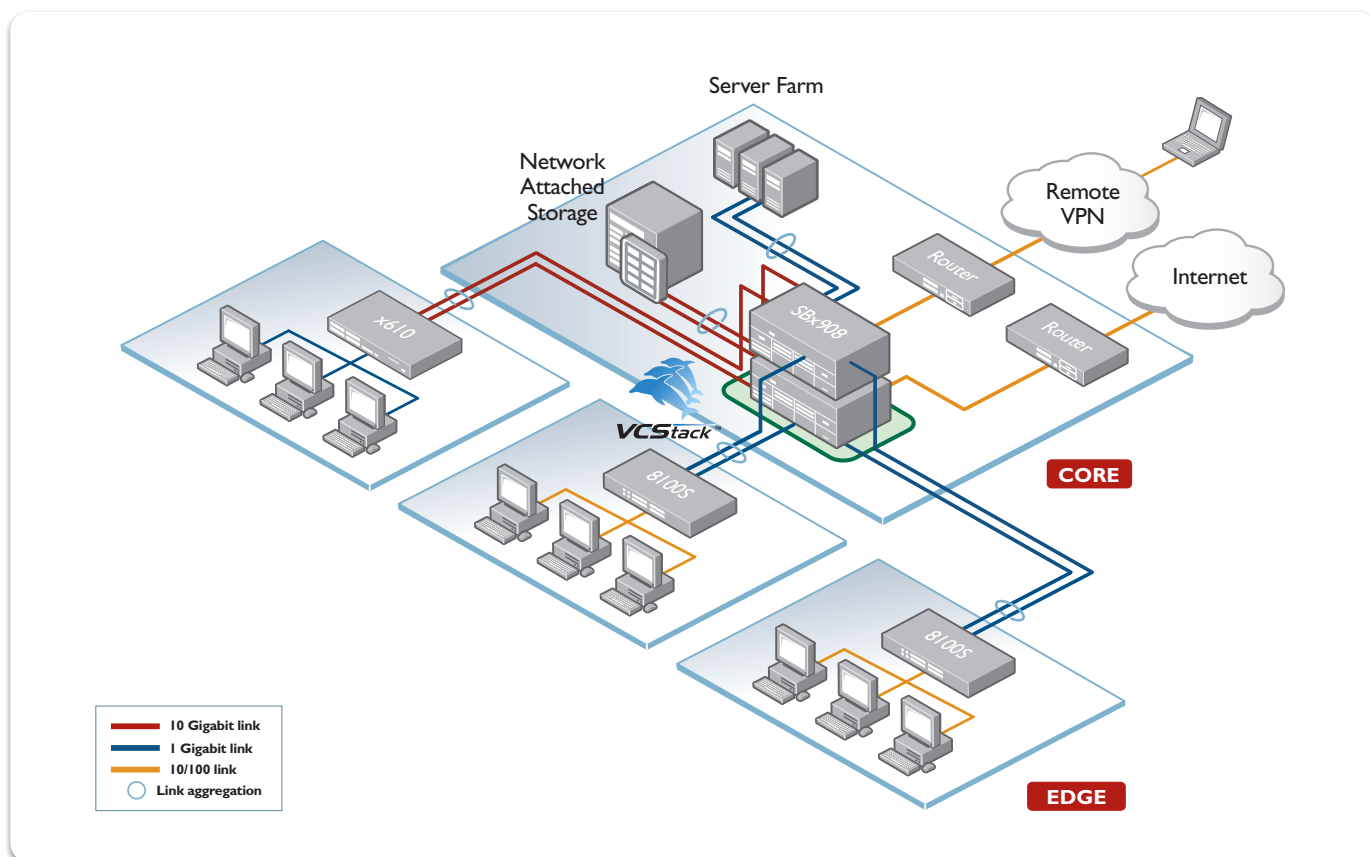

Diagram 2

Graceful restart for dynamic routing protocols

Along with VCStack, the other key component of this IPv6 high availability solution is the implementation of graceful restart (also known as non-stop forwarding) within IPv6 dynamic routing protocols. Graceful restart is a feature that has been added to routing protocols (RIP, OSPF, BGP) in recent years. It enables Layer 3 routing to continue uninterrupted even while one of the routers in the network is, for a brief period, not participating in the routing protocol that is used to populate the routers' route tables.

In normal circumstances, when routers detect that a neighbor is no longer participating in the routing protocol, they discard routes learnt from that neighbor. With graceful restart, the router that is going to briefly drop out of the protocol can inform its neighbors of its intention, and request that they continue to operate as though it was still participating.

Combining VCStack and graceful restart allows achievement of true Layer 3 router resiliency. VCStack enables multiple Layer 3 switches to operate together as one, and graceful restart keeps data flowing if the master switch of the VCStack is lost and the stack briefly drops out of a routing protocol while a new master takes over.

Combining that with graceful restart within the routing protocols provides a solution that can enable a Layer 3 switched IPv6 network to hitlessly recover from link loss, and recover from the loss of a stack member in very few seconds.

Summary

The standard Internet protocol of the future is IPv6. In the coming years, a great deal of time and effort will be expended in the process of transferring data communication systems from IPv4 to IPv6. The simpler this process is made for people, the more smoothly it will progress, and the less it will cost.

By providing a resilient Layer 3 switching solution, at an affordable price, that enables IPv4 and IPv6 to work in parallel with equal reliability and performance, Allied Telesis is able to help smooth the transition, as shown in diagram 3.

Full support for IPv6 transition technologies and resilient network products and protocols ensure that Allied Telesis switching technology provides a solution that is easy to manage, scalable and future-proof.
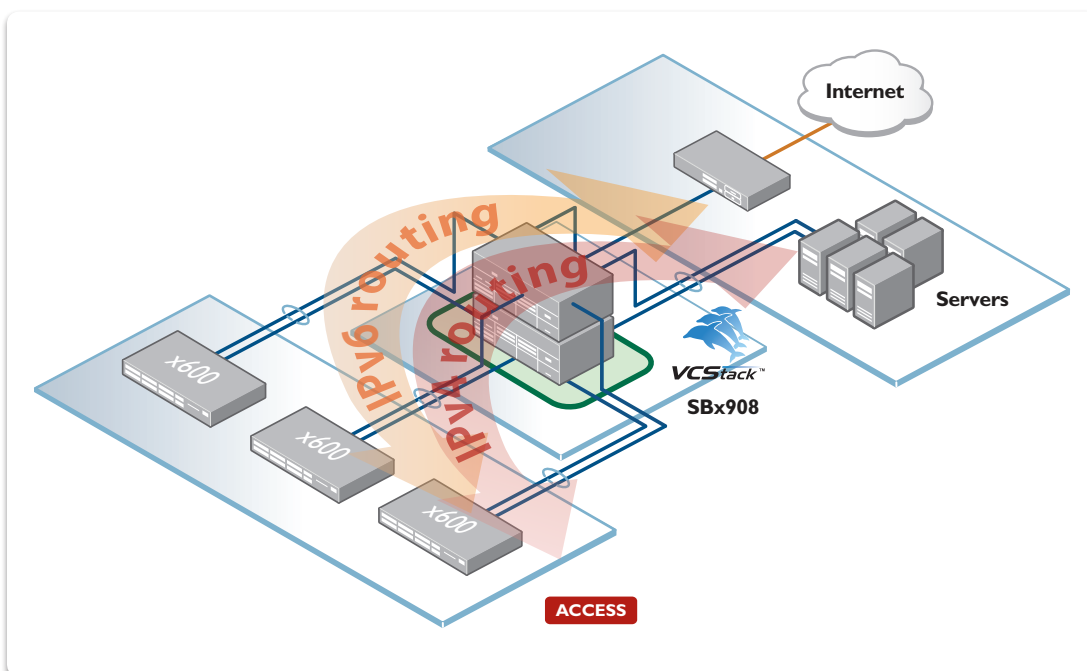
Diagram 3 - IPv4 and IPv6 dynamic routing in parallel via a VCStack Layer 3 switch

Products

Allied Telesis has a range of products that will make the transition

SwitchBlade x908

ADVANCED LAYER 3 MODULAR SWITCHES

The Allied Telesis SwitchBlade® x908 advanced Layer 3 modular switch offers high flexibility and density in a small physical size, providing scalable and versatile switching solutions for today's enterprise networks. Each chassis supports eight high-speed 60Gbps expansion bays, and can be paired in a VCStack.

- 10GbE/GbE aggregator for mid-size data center or network core
- 3RU medium density modular platform
- 8 × 60Gbps 'XEM' module bays (same XEMs as x900 family)
- Hot-swappable PSUs, 1 + 1 PSU redundancy

Max capability:
- 96 × GbE ports
- 16 × 10GbE ports

With VCStack passive backplane:
- 192 × GbE ports
- 32 × 10GbE ports

Key features

» Resilient

» Scalable

» Reliable

» High-performing

» Easy to manage

x610 Series

ADVANCED LAYER 3+ GIGABIT ETHERNET STACKABLE SWITCHES

The Allied Telesis x610 Series is the high performing and scalable solution for today's networks, providing an extensive range of port-density and uplink-connectivity options. With a choice of 24/48-port versions with optional 10 Gigabit uplinks and PoE+ ports, plus the ability to stack up to eight units, the x610 Series can connect anything from a small workgroup right up to a large business.

x900 Series
ADVANCED LAYER 3 SWITCHES

The Allied Telesis x900 Series is one of our most advanced series of switches and is unmatched in performance, flexibility and reliability. This series provides fine service provisioning granularity, high availability, and advanced QoS. All x900 switches incorporate a switching core that yields wirespeed IPv4 and IPv6 routing and most switches feature robust hardware with dual hot-swappable power supplies.

- 1RU semi modular platform
- Hot-swappable PSUs
- 1 + 1 PSU redundancy

Typical configuration:
24 or 36 x 10/100/1000T ports

AT-XEM-2XP
2 x 10GbE (XFP) ports
AT-XEM-2XS
2 x 10GbE (SFP+) ports
AT-XEM-2XT
2 x 10GbE (RJ-45) ports
AT-XEM-12S
12 x 100/1000X SFP ports
AT-XEM-12T
12 x 10/100/1000T (RJ-45) ports
AT-XEM-STK
2 x high-speed stacking ports

- Allied Telesis x900 Series switches encompass the advanced features required in modern converged data center environments.
- The x900 Layer 3+ switches have fully non-blocking switching on all ports, so IPv4 Layer 2 switching and Layer 3 routing occur at wirespeed. This is ideal for high-end server deployments, and when aggregating Gigabit connections.
- The x900 switches also feature front-to-back cooling, maximizing their reliability in respect of the cooling requirement of the data center.

- 10GbE expansion modules provide high-speed uplinks, with the option of up to 40Gbps capacity to the network core.
- The x900 Layer 3+ switches operate with one PSU - installing a second PSU provides redundancy. Internal PSUs eliminate the need for an external Redundant Power Supply (RPS) that occupies valuable rack space. Built-in redundancy guarantees the continued delivery of essential services.

About Allied Telesis Inc.

Allied Telesis is a world class leader in delivering IP/Ethernet network solutions to the global market place. We create innovative, standards-based IP networks that seamlessly connect you with voice, video and data services.

Enterprise customers can build complete end-to-end networking solutions through a single vendor, with core to edge technologies ranging from powerful 10 Gigabit Layer 3 switches right through to media converters.

Allied Telesis also offer a wide range of access, aggregation and backbone solutions for Service Providers. Our products range from industry leading media gateways which allow voice, video and data services to be delivered to the home and business, right through to high-end chassis-based platforms providing significant network infrastructure.

Allied Telesis' flexible service and support programs are tailored to meet a wide range of needs, and are designed to protect your Allied Telesis investment well into the future.

For further information visit us online at **alliedtelesis**.com

Allied Telesis™   the **solution** : the **network**

North America Headquarters | 19800 North Creek Parkway | Suite 100 | Bothell | WA 98011 | USA | T: +1 800 424 4284 | F: +1 425 481 3895
Asia-Pacific Headquarters | 11 Tai Seng Link | Singapore | 534182 | T: +65 6383 3832 | F: +65 6383 3830
EMEA & CSA Operations | Antareslaan 18 | 2132 JE Hoofddorp | Netherlands | T: +31 23 5656800 | F: +31 23 5575466

alliedtelesis.com

Free Manuals Download Website

http://myh66.com

http://usermanuals.us

http://www.somanuals.com

http://www.4manuals.cc

http://www.manual-lib.com

http://www.404manual.com

http://www.luxmanual.com

http://aubethermostatmanual.com

Golf course search by state

http://golfingnear.com

Email search by domain

http://emailbydomain.com

Auto manuals search

http://auto.somanuals.com

TV manuals search

http://tv.somanuals.com